

**§ 172.240 Permeability of spaces.**

When doing the calculations required in § 172.225,

(a) The permeability of a floodable space, other than a machinery or cargo space, must be assumed as listed in Table 172.240;

(b) Calculations in which a machinery space is treated as a floodable space must be based on an assumed machinery space permeability of 85% unless the use of an assumed permeability of less than 85% is justified in detail; and

(c) Calculations in which a cargo space that is completely filled is considered flooded must be based on an assumed cargo space permeability of 60% unless the use of an assumed permeability of less than 60% is justified in detail. If the cargo space is not completely filled, a cargo space permeability of 95% must be assumed unless the use of an assumed permeability of less than 95% is justified in detail.

TABLE 172.240—PERMEABILITY

Spaces and tanks	Permeability (percent)
Storeroom spaces .....	60
Accommodations spaces .....	95
Voids .....	95
Consumable liquid tanks .....	<sup>1</sup> 95 or 0
Other liquid tanks .....	<sup>2</sup> 95 or 0
Cargo (completely filled) .....	60
Cargo (empty) .....	95
Machinery .....	85

<sup>1</sup> Whichever results in the more disabling condition.

<sup>2</sup> If tanks are partially filled, the permeability must be determined from the actual density and amount of liquid carried.

**§ 172.245 Survival conditions.**

A vessel is presumed to survive assumed damage if it meets the following conditions in the final stage of flooding:

(a) *Final waterline.* The final waterline, in the final condition of sinkage, heel, and trim must be below the lower edge of an opening through which progressive flooding may take place, such as an air pipe, or an opening that is closed by means of a weathertight door or hatch cover. This opening does not include an opening closed by a:

- (1) Watertight manhole cover;
- (2) Flush scuttle;
- (3) Small watertight cargo tank hatch cover that maintains the high integrity of the deck;

(4) Class 1 door in a watertight bulkhead;

(5) Remotely operated sliding watertight door;

(6) Side scuttle of the nonopening type;

(7) Retractable inflatable seal; or

(8) Guillotine door.

(b) *Heel angle.* The maximum angle of heel must not exceed 15 degrees, except that this angle may be increased to 17 degrees if no deck edge immersion occurs.

(c) *Range of stability.* Through an angle of 20 degrees beyond its position of equilibrium after flooding, a vessel must meet the following conditions:

(1) The righting arm curve must be positive.

(2) The maximum righting arm must be at least 4 inches (10 cm).

(3) Each submerged opening must be weathertight

(d) *Metacentric height.* After flooding, the metacentric height must be at least 2 inches (50 mm) when the vessel is in the equilibrium position.

(e) *Progressive flooding.* In the design calculations required by § 172.225, progressive flooding between spaces connected by pipes, ducts or tunnels must be assumed unless:

(1) Pipes within the assumed extent of damage are equipped with arrangements such as stop check valves to prevent progressive flooding to other spaces with which they connect; and,

(2) Progressive flooding through ducts or tunnels is protected against by:

(i) Retractable inflatable seals to cargo hopper gates; or

(ii) Guillotine doors in bulkheads in way of the conveyor belt.

## PART 173—SPECIAL RULES PERTAINING TO VESSEL USE

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